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ABSTRACT

It is often difficult to motivate high school students to do their homework on a regular basis. This research project sought to determine the effectiveness of one possible stimulus in this area. The purpose of this research project was to measure the relationship (if any) between administering "pop-quizzes" to students and students' homework performances. Through the use of control and test groups, measurements were made in such a way as to reduce the effect of many extraneous variables. The particular questions that were being examined were: (1) "What is the correlation between administering pop-quizzes and students' homework averages?" and (2) "What is the correlation between administering pop-quizzes and the frequency at which students attempt their homework?" The results of these measurements indicate that there was essentially no correlation between administering pop-quizzes and the frequency of attempting homework. There was a small, but not statistically significant, correlation between the administration of pop-quizzes and homework averages. (Author)

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The Relation Between Pop-Quizzes & Homework Performance

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Abstract

It is often difficult to motivate high school students to do their homework on a regular basis. This research project sought to determine the effectiveness of one possible stimulus in this area. The purpose of this research project was to measure the relationship (if any) between administering "pop-quizzes" to students and students' homework performances.

Through the use of control and test groups, measurements were made in such a way as to reduce the effect of many extraneous variables. The particular questions that were being examined were: 1) "What is the correlation between administering pop-quizzes and students' homework averages?" and 2) "What is the correlation between administering pop-quizzes and the frequency at which students attempt their homework?"

The results of these measurements indicate that there was essentially no correlation between administering pop-quizzes and the frequency of attempting homework. There was a small, but not statistically significant, correlation between the administration of pop-quizzes and homework averages.

Rationale

One of the goals of every teacher has always been to raise the achievement level of students. One of the most universally accepted techniques that teachers use toward this end is assignment of homework. This endorsement of homework is not without the backing of research. "The most extensive traditional narrative reviews of the empirical research on homework conclude that its effects on learning are generally favorable" (Paschal, 1984). In a study comparing the effects of seven different variables upon academic achievement, Keith found homework to be a very important influence, second only to intellectual ability (Keith, 1986). He states "Homework ... had a fairly powerful positive effect on achievement, even after controlling for other well-known influences, such as those from ability, family background, and ethnicity."

Given that homework is considered a beneficial task toward improving academic achievement, a logical question might be "How can a teacher increase homework performance, thereby elevating overall achievement?" Teachers employ a variety of techniques to attempt to motivate students to do their homework assignments. One common method is to give frequent unannounced pop-quizzes over material covered by prior homework assignments. The concept being that students will do the work if there is a chance that they will be required to show comprehension by the following day with grade credit being awarded for successfully demonstrating the knowledge or skill. The aim of this research is to measure the effectiveness of this motivational technique.

Subject Background

The research was performed at McCullough High School (Conroe Independent School District) in the Spring of 1989. McCullough High is located in The Woodlands, TX, a northern suburb of Houston. The Woodlands is a planned residential community which has a demography consisting of mainly white, upper middle class families.

Subjects in this research were obtained from four sections of Physics I Level. At McCullough, Physics I is offered in both the Level and Honors tracks. The classes consisted of 30 girls and 51 boys and included 26 juniors and 55 seniors. Of these 81 students, only nine students could be classified as minorities. The class sizes were as follows: period 1 —— 22 students; period 3 —— 18 students; period 4 —— 20 students; and period 5 —— 21 students.

The motivation level of the students involved was probably higher than usual because of the fact that Physics is an elective course. Behavioral problems among the students were rare though occasionally, they did exist.

Methods

During the fifth six week term of the school year, class periods one (7:25 am) and four (11:30 am) took regular pop-quizzes over the previous night's homework assignment, while periods three (9:30 am) and five (1:30 pm) did not. In both groups, every homework assignment was collected and reviewed. This gave both groups of students ample opportunity to get feedback on their performances. In the test group, a short pop quiz was commonly given at the very beginning of the period following days in which assignments were given. At the beginning of the third six week term, the groups were swapped so that class periods three and five took the pop-quizzes while periods one and four did not.

The purpose of swapping the test and control groups halfway through the experiment was to reduce the effect of extraneous variables such as ability differences between the various class periods, different levels of difficulty in subject matter during the testing phase, and differences in motivation levels due to the time of year. (This last variable mentioned is especially important when working with graduating seniors.)

Homework was assigned about three nights per week. Pop-quizzes were administered unannounced once or sometimes twice a week. Solutions to the quizzes were immediately reviewed along with a few of the homework problems. For the control group, nearly all of the homework problems were reviewed in class.

Results

Pop-Quizzes and Homework Averages

A biserial coefficient was used to determine the correlation between the administration of pop-quizzes and students' homework averages. This type of correlation was selected since the homework average is considered a continuous variable (even though they were rounded off to the nearest whole number) while the administration of pop-quizzes is an artificial dichotomous variable.

The value of the biserial correlation coefficient was measured to be r_{bis}=+0.1348 with n equal to 81 students. This value does not represent a statistically significant correlation at the α=0.05 level.

Pop-Quizzes and Frequency of Attempting Homework

The students' homework grades for the two six week periods were also evaluated on the basis of whether or not they attempted the assignment. A tetrachoric coefficient was used to determine the correlation between the administration of pop-quizzes and the frequency at which students attempted their homework assignments. This choice was made since, in this case, both variables are artificial dichotomous variables.

The value of the tetrachoric correlation coefficient was measured to be r_{tet}=-0.0683 with n equal to 2101 total assignments. This coefficient value indicates that there was essentially no correlation at all between these two variables.

Discussion

The results show that though there may be a small correlation between giving pop-quizzes and homework averages, these is no correlation at all with giving pop-quizzes and frequency at which the students attempted their homework assignments.

One possible hypothesis to explain these results is that giving regular pop-quizzes may motivate students who normally do their homework to work somewhat harder, thereby increasing the overall performance very slightly. On the other hand, the pop-quizzes did not seem to motivate those who were not even attempting the assignments to change their practice.

Data

Table 1. Homework Averages with and without Pop-Quizzes.

With Pop-Quizzes.

first period, 5th term
40 34 85 83 81 69 82 88 73 81 60 90 64 84 93 64 87 88 98 79 77 64

fourth period, 5th term
81 47 87 37 86 75 92 83 83 92 57 93 53 86 77 65 88 96 63 73

third period, 6th term
80 78 63 90 76 63 49 70 57 14 81 71 75 40 58 25 41 80

fifth period, 6th term
19 78 76 60 59 81 49 43 78 67 57 95 45 92 13 93 59 0 12 72 74

Without Pop-Quizzes.

third period, 5th term
91 79 79 72 85 68 12 75 60 40 89 83 79 71 80 58 53 86

fifth period, 5th term
56 96 91 88 70 85 76 76 74 78 59 97 52 89 42 67 77 0 31 83 90

first period, 6th term
5 48 65 71 79 63 64 90 49 72 64 90 43 70 85 45 64 73 90 55 79 47

fourth period, 6th term
46 43 60 21 74 71 77 48 88 79 91 49 64 62 73 72 62 80 88 56

Table 2. Attempts at Homework with and without Pop-Quizzes.

1 represents an attempted homework assignment
0 represents an assignment which was not attempted
Missing assignment values represent absences.

With Pop-Quizzes.

first period, 5th term
0101101111000
1001111100000
1111111111011
1110011111111
1111101111
11111
1111111111111
1111111111111
1101101111011
1101111111
1100110111011
1111111111111
1101111111111
1111101111111
1111111111111
1101101110011
11111111
1111111111111
1111111111111
1111101111111
1111111111111
11011111111

fourth period, 5th term
111110
1100110010111
1110111111
0000011111100
11111111111
1111111111111
1111111111
1111101111111
1111111111111
1111111111111
1111001111100
1111111111111
1111100000011
1111111111
1111111111110
1011111110101
1111111111111
11111111111
11111111100
1111011

third period, 6th term
1011111111111111
0110111111111111
1110101111011
1111111111111
1101111111111100
1111110111011111
1000100011111
1110111111111111
1111111111101111
0100010000100000
1111111111111111
1111111111111100
1111111111111
1111111000100000
1100101110111111
1100011000100000
0011100011111011
1111111111111

fifth period, 6th term
1000010000100001
1101111111111001
0111111111111111
1101111100111
0110101110111111
1110111011111111
1110011010000111
1110011010000011
1111110011111
0110111111111101
1000111001111011
1111111110111111
0100111001100101
1111111111111
1100000000100000
1111111111111
1111110111100111
0000000000000000
0100000000000001
0111111111111011
1111111110111100

Table 2. continued...

With no Pop-Quizzes.

third period, 5th term
11111111
11100111111111
111011111
111111110
11111111111
11110101111111
1001001000001
111011111111
11111111101111
1000011000101
11111111111111
111111110111
11111111111
11110011111111
111101101111
10110101011111
111111101
111111111

fifth period, 5th term
011111101100
11111111111
11111111111
1111111111
10010111111
11111111111111
1111111111
1111111111
1111111111
11111111111011
10000011111111
11111111111111
1000010111
11111111
100011
111111101
11101101111111
00000000000000
10001001100111
1100111111
11111111111

first period, 6th term
00000010000000000
11100010001101111
11100011101111111
11100111111111111
11111111111111011
1111111101
111111111111
1111111111111111
01100011111100011
11110111111
11101011111111110
11111111111111
10111110101
11001111111111
11111111111111111
011111000101
11100111111111111
11100111111111111
11111111111111101
10111110111111
11111111111111111
11101101100101

fourth period, 6th term
11110100011
11101110010000111
11100111110101111
00101110000000000
11111111111111
11011111111111111
11111111111111001
11101100111111001
11111111111111111
11101111111111
11111111111111111
11111100
11111100111111110
1011111111
11010111111111101
11101111011101111
11111100011111111
11111111111111111
11111101111111111
10111111101001011

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